

174A ABSTRACTS - Cardiac Function and Heart Failure

JACC

March 19, 2003

-80 ms (RV leading) in steps of 20 ms. LV systolic function was evaluated by the maximum rate of LV pressure development (dP/dtmax) recorded by a Millar™ catheter.

Results: Compared to RV pacing the mean increase in dP/dtmax with BV pacing was 30% (range -4.5% to 85%). The best pacing mode was BV in 7 patients, LV in 9 patients, and sBV in 18 patients (table). In the later 2 groups the additional mean increase was 7% with sBV (range 1 - 22%) and 9% with LV (range 2 - 23%). In sBV the mean optimized delay was +32 ms ± 21 (range +60 ms to -20 ms).

	BV	LV	BVs
n	7	9	18
RV dP/dtmax (mmHg/s)	873±227	881±238	899±221
BV dP/dtmax (mmHg/s)	1235±306**	1065±323**	1143±241**
Best Mode dP/dtmax (mmHg/s)	1235±306	1162±271*	1223±248*

* p<0.05 compared to BV **p<0.05 compared to RV

Conclusions: A slight optimization of CRT can be achieved by the aid of sBV in about 50% of the patients. The results demonstrate that LV activation sequence is more important than mere synchrony of electrical events in CRT.

1110-69

Isolated Left Ventricular Pacing Is Superior to Biventricular Pacing in Patients With Normal PQ-Time

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Background: Cardiac resynchronization therapy (CRT) has been mainly studied in patients (pts) with left bundle branch block and atrioventricular (AV) block of variable degree. Whether CRT has to be exerted by biventricular pacing (BV) or left ventricular pacing (LV) in pts with intact AV conduction remains to be determined. Our aim was to test whether PQ-time provides a rationale for pacing mode selection in CRT.

Methods: 26 pts eligible for CRT (age: 66 ± 8 years, female: 7, ejection fraction 22 ± 5 %, QRS 173 ± 23 ms, NYHA ≥ 3) underwent an invasive hemodynamic study with temporary multisite pacing. Right ventricular (RV), LV and BV pacing was performed. Hemodynamic response was evaluated by the maximum rate of LV pressure development (dP/dtmax) recorded by a Millar™ catheter. Pts were grouped to those with PQ ≤ 200 ms (mean 183 ± 14 ms, n=16) or with AV block of variable degree (PQ > 200 ms, n=10).

Results: In all pts, LV and BV pacing was superior to RV pacing (Table). In pts with normal PQ-time, LV pacing was equal (n=11) or superior to BV (n=5). In pts with AV block, BV pacing was superior (n=7) or equal to LV (n=3). Compared to BV, LV pacing increased QRS in both groups, especially in pts with PQ > 200 ms.

	PQ ≤ 200 ms			PQ > 200 ms		
Mode	RV	LV	BV	RV	LV	BV
mmHg/s	916±215*	1154±275*	1068±257	811±271*	1075±273*	1147±304
QRS(ms)	199±27*	163±21*	148±15	213±36*	243±37*	157±36

(*p<0.01 compared to BV)

Conclusions: In pts with normal PQ-time, atrial triggered LV pacing may be favoured to BV stimulation. Sparing the RV lead and unphysiological RV apical stimulation may not only promote clinical outcome but also reduce costs of CRT, as LV pacing can be performed using standard dual chamber pacemakers.

1110-70

Evidence of Continued Reverse Remodeling After One-Year of Cardiac Resynchronization Therapy

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Cardiac resynchronization therapy over 6 months has been shown to improve NYHA functional class, exercise capacity, quality of life and cardiac structure and function in patients with moderate to severe heart failure. We evaluated whether the beneficial effects demonstrated by echocardiographic measures were sustained at one year of continuous therapy. **METHODS:** Following implantation of an atrial-synchronous bi-ventricular pacing device, patients were randomized to control or treatment. Doppler echocardiograms were recorded in patients at baseline, 6 and 12 months and were digitized to obtain LV end-diastolic (EDV) and end-systolic (ESV) volumes, dimension (EDD) and ejection fraction (EF). Mitral regurgitation (MR) was assessed as the average of the color flow jet area from two views. LV mass was calculated using the formula: 5/6(LV short axis area)(LV cavity length) **RESULTS:** 95 patients were implanted, randomized to the treatment arm and had baseline, 6 and 12 month echocardiograms performed and analyzed. The median paired differences were compared for each echo parameter between baseline and 6 months (*p<0.05) and between 6 months and 12 months (+, p<0.05) using the Wilcoxon rank sum test. Table, median (95% CI). **CONCLUSIONS:** Cardiac resynchronization therapy resulted in concomitant improvements in LV dimension, ejection fraction and mass at one year, providing evidence of continued reverse remodeling in heart failure patients on optimal medical therapy.

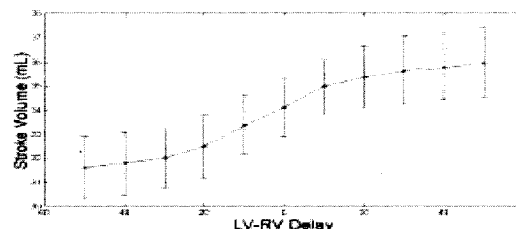
Variables	Baseline	6-month	12-month
LVEDV (cm ³)	302 (270, 320)	227 (216, 271)*	249 (227, 288)
LVESV (cm ³)	228 (206, 253)	167 (148, 208)*	171 (153, 205)
LVEF (%)	23.1 (22.0, 24.4)	27.6 (26.1, 30.5)*	30.4 (28.4, 33.6)+
MR (cm ²)	6.78 (5.55, 8.90)	3.0 (1.9, 3.9)*	3.4 (2.2, 4.6)
LVEDD (cm)	7.4 (7.0, 7.7)	7.1 (6.4, 7.8)*	6.5 (6.3, 7.1)+
LV mass (g)	341 (315, 369)	324 (293, 352)*	286 (271, 307)+

1110-71

Effect of Interventricular Pacing Delay on Hemodynamics With Biventricular Pacing in Pigs With AV Node Ablation and Atrial Fibrillation

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Background: Recent studies have shown benefits of biventricular pacing (BVP) in heart failure patients with AV node ablation for atrial fibrillation (AF). Little has been reported regarding optimal timing of the pacing pulses with respect to each other. We investigated the hemodynamics of BVP utilizing a range of interventricular pacing delays in 6 pigs with AV node ablation and sustained AF. **Methods:** Six pigs were instrumented with 2 pairs of ultrasonic crystals for measuring LV volume, a high fidelity pressure catheter for measuring LV pressure and AgCl pacing electrodes placed at RV apical and LV mid-lateral positions. The AV node was ablated and AF was sustained by burst pacing. BVP was initiated using each of a set of randomly selected LV-RV interventricular delays ranging from -50 msec to +50 msec in increments of 10 msec. Pacing at each delay was repeated in a different randomized sequence. **Results:** LV-RV delay was regressed with stroke volume (SV) and stroke work (SW) and revealed significant relationships with pacing delay (P<0.0001, P=0.0007). The relationships indicate increased hemodynamic benefit with greater LV delay as shown for SV with the standard errors in the figure. No significant relationship was found between systolic pressure and delay. **Conclusions:** In pigs with AF and AV node ablation, RV pre-excitation causes a more efficient ejection of blood than LV pre-excitation. When evaluating the hemodynamics of BVP, volume measurements may differ without associated pressure changes.



1110-72

Cardiac Resynchronization Therapy in Elderly Patients With Heart Failure: The InSync Italian Registry

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Background: Heart failure (HF) in elderly population is associated with polypharmacy medication and recurrent hospitalizations. Cardiac resynchronization therapy (CRT) has been demonstrated to be effective in treating pts with drug refractory HF. The InSync Italian Registry is a prospective and non-randomized study to monitor CRT. The aim of our study was to assess the efficacy of CRT in elderly HF patients (pts).

Methods: 300 pts with advanced HF (NYHA class 3-4), EF120ms where divided into four age-ranked groups A (80 yrs).

Results: 39 pts (mean age = 53±6 yrs) were in group A, 110 (65±3 yrs) in group B, 130 (74±3 yrs) in group C and 21 (82±2 yrs) in group D. The four groups presented baseline differences as far as female percentage (A=8%, B=15%, C=20%, D=33%; D vs A p<0.05), HF etiology different from idiopathic and ischemic (A=20%, B=13%, C=16%, D=38%; D vs B and C p<0.05). No significant differences were observed in HF symptoms duration (A=49±55 mos, B=39±45 mos, C=42±47 mos, D=32±22 mos) and history of atrial fibrillation (A=31%, B=35%, C=37%, D=40%). After a 6 months follow-up period NYHA class moved from 3,18±0.39 to 2,13±0.74 in group A (p<0.001), from 3,22±0.41 to 2,16±0.57 in group B (p<0.001), from 3,28±0.45 to 2,04±0.66 in group C (p<0.001) and from 3,29±0.46 to 2,22±0.44 in group D (p<0.001). No significant differences were observed in baseline and 6 months follow-up NYHA class between the 4 groups.

Conclusions: CRT induced a similar and significant clinical improvement in all the classes of age considered. Non-compliance and poor recollection of prescribed polypharmacy medication are common in elderly HF patients and associated with higher frequency of hospitalization. Thus CRT could have clinical and cost-effectiveness implications for the treatment of these pts.

1110-73

Restrictive Left Ventricular Filling Pattern Predicts Response to Cardiac Resynchronization Therapy: A Role for Diastolic Ventricular Interaction?

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Background: The mechanism of benefit from Cardiac Resynchronization Therapy (CRT) has been attributed to improvements in intraventricular synchrony. Improvements in Diastolic Ventricular Interaction (DVI), in which left ventricular filling is constrained by the